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Laboratory Services

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CHILDREN'S®**

When your child needs a hospital, everything matters.

Thyroid Dysfunction in Children: When and How to Test

Children may develop thyroid problems at different stages of life. Possible diagnoses include congenital hypothyroidism, primary hypothyroidism, central hypothyroidism and hyperthyroidism, all of which require formal diagnostic testing and evaluation by a pediatric endocrinologist.

To determine when it is appropriate to perform testing for thyroid dysfunction in children, please refer to the following tools or consult our Physician Direct Connect Line at (614) 355-0221 or (877) 355-0221.

Pediatric Thyroid Screening

After the newborn period, testing for thyroid function will depend on the clinical context including symptoms, physical exam and family history of children presenting to the primary care office. Symptoms of hypothyroidism are often vague and nonspecific and include fatigue, depression, constipation, hair loss, dry or coarse skin or hair, irregular menses, modest weight gain (no more than 5-10 lbs.), sensitivity to cold, poor growth, goiter or memory changes.

Laboratory reference ranges should be used when evaluating thyroid screening results. Values that fall within the reference range, whether at the lower or upper ends are normal and should not be the basis for additional testing or referral. In addition, some values that fall just outside the reference range may also be normal in the clinical context.

When to evaluate thyroid function

- Poor linear growth with normal/preserved weight gain
- Symptoms of hypothyroidism (noted above)
- Chromosomal or genetic syndromes associated with thyroid dysfunction (e.g. Down Syndrome)
- Use of certain medications (e.g. anti-epileptic drugs, anti-psychotics, lithium)
- Signs of hyperthyroidism (tachycardia, hypertension, weight loss, tremors)

Note: Evaluation of thyroid function is best done about one week after an acute illness

When NOT to evaluate thyroid function

- Obesity without other obvious signs of thyroid dysfunction; TSH may be mildly elevated in obesity (TSH < 10 μ IU/mL) and does not necessarily indicate thyroid dysfunction
- Within a few days of previous results; wait at least four weeks before repeating tests
- During or shortly following an illness; “sick euthyroid” syndrome (nonthyroidal illness) may result in temporarily abnormal thyroid function tests

Testing Thyroid Function

When testing thyroid function in children, please order both a TSH and free T4 and use the laboratory’s pediatric reference ranges to determine whether they are normal. In general, we do not recommend sending a total T4 or total T3 level for an initial screen, as these may be affected by binding protein concentrations.

Low Free T4

TSH low or within the reference range

- If you have concerns about linear growth, puberty, headaches or vision changes, please call the Physician Direct Connect Line and ask to speak to an endocrinologist
- If there are no such concerns, wait four to six weeks and repeat TSH and free T4. The low results are typically due to recent illness or lab variation

Elevated TSH

TSH 5-10 μ IU/mL and free T4 within or above the reference range

- Wait approximately four weeks, repeat both TSH and free T4. Also obtain anti-thyroperoxidase (TPO) and anti-thyroglobulin (Tg) antibodies
 - If TSH and free T4 are normal and antibodies are negative, no further testing is recommended
 - If TSH is elevated and free T4 is low, refer for evaluation by endocrinology
 - If TSH and free T4 are normal but one or both antibodies are positive, a diagnosis of Hashimoto’s thyroiditis can be made. Recommend a non-urgent evaluation by endocrinology to discuss treatment and monitoring

TSH > 10 μ IU/mL and free T4 within the reference range

- Refer for non-urgent evaluation by endocrinology
- Lab studies can be repeated at the time of the endocrinology evaluation

TSH > 10 μ IU/mL and free T4 less than the lower limit of the reference range

- For child <3 years of age: recommend urgent evaluation by endocrinology

Note: Call endocrinology to discuss treatment and referral

- For child >3 years of age: recommend evaluation by endocrinology

Note: Lab studies and treatment will be discussed at time of endocrinology evaluation

Low TSH

TSH < 0.5 μ IU/mL and free T4 within the reference range

- Wait two to four weeks and repeat TSH and free T4. Refer if persistent
- Typically due to normal population variation or recent illness

TSH < 0.5 μ IU/mL (typically less than assay) and free T4 above the upper limit of the reference range

- Refer for evaluation by endocrinology
- If child is symptomatic (weight loss, hypertension, palpitations, tremors) or if free T4 >3 ng/dL, please call the Physician Direct Connect Line for help with urgent evaluation
- If child is asymptomatic and free T4 <3 ng/dL, evaluation is not urgent

“New ICD-10 Codes for Obesity Treatment: Advancements in Accurate Diagnosis and Care.” Obesity Medicine Association, 25 Sept. 2024, obesitymedicine.org/blog/new-icd-10-codes-for-obesity-treatment-advancements-in-accurate-diagnosis-and-care/.

Spotlight on Client Services:



Tyler started working with Nationwide Children's Hospital in April of 2024 and has an extensive history in working in the clinical laboratory setting. Tyler enjoys going to the theatre, reading and being as social as possible. Tyler has a 4-year-old cat named Dexter. Tyler's top clip for clients is to take the extra time

to verify that the correct identifiers are on all tubes/containers immediately after collection while the patient is still in the room.



Cold Weather and Lockbox Specimen Storage

Now that winter has arrived, it is imperative that samples placed in a lockbox outdoors prior to transport to the laboratory be maintained at the appropriate temperature, especially on those days and evenings when outside temperatures dip below freezing. If refrigerated samples are stored in your lockbox, a room temperature gel pack should be placed in the lockbox to maintain the samples at the refrigerated temperature and preventing them from freezing while left outside. The gel pack should not be frozen, since you do not want refrigerated whole blood samples to freeze. By following this lockbox practice, you will help insure the integrity of the samples and ultimately obtain reliable laboratory results.



Courier Schedule and Inclement Weather

If you are closing your office due to inclement weather, or making seasonal changes to your practice schedule, please notify us by contacting Laboratory Client Services at (800) 934-6575. Notifying us of these changes allows us to streamline all scheduled travel routes. We appreciate your partnership in helping us keep our drivers safe during extreme weather.



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How can Nationwide Children's Laboratory Services help your practice?

If you would like to become a client or learn more information about Nationwide Children's Laboratory Services, contact us at (800) 934-6575 or visit our website at **NationwideChildrens.org/Lab**. Would you like to receive the Nationwide Children's Laboratory Services Newsletter electronically? Please e-mail us at **LaboratoryServices@NationwideChildrens.org** and let us know!

Lab Account Representatives are available via email to assist with any questions or concerns.

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